

Unit 6 Day 1

p51-52: 1-8 all, 12-36 even (1)

① $\frac{x+3}{x-6}$ $\begin{matrix} x-6 \neq 0 \\ x \neq 6 \\ \{x | x \neq 6\} \end{matrix}$

② $\frac{2x-4}{x+7}$ $\begin{matrix} x+7 \neq 0 \\ x \neq -7 \\ \{x | x \neq -7\} \end{matrix}$

③ $\frac{3x+7}{(4x+2)(x-1)}$
 $(4x+2)(x-1) \neq 0$
 $4x+2 \neq 0 \quad x-1 \neq 0$
 $4x \neq -2 \quad x \neq 1$
 $x \neq -\frac{1}{2} \quad x \neq 1$
 $\{x | x \neq -\frac{1}{2}, 1\}$

④ $\frac{9x+12}{(2x+3)(x-5)}$
 $(2x+3)(x-5) \neq 0$
 $2x+3 \neq 0 \quad x-5 \neq 0$
 $2x \neq -3 \quad x \neq 5$
 $x \neq -\frac{3}{2} \quad x \neq 5$
 $\{x | x \neq -\frac{3}{2}, 5\}$

⑤ $\frac{12}{(x^2+5x+6)}$
 $x^2+5x+6 \neq 0$
 $(x+3)(x+2) \neq 0$
 $x+3 \neq 0 \quad x+2 \neq 0$
 $x \neq -3 \quad x \neq -2$
 $\{x | x \neq -3, -2\}$

⑦ $x-k=0$ when $x=3$
 $3-k=0$
 $-k=-3$
 $k=3$
 undefined
 $\boxed{k=3}$

⑥ $\frac{3}{x^2-5x-6}$ $\begin{matrix} x^2-5x-6 \neq 0 \\ (x-6)(x+1) \neq 0 \\ x-6 \neq 0 \quad x+1 \neq 0 \\ x \neq 6 \quad x \neq -1 \end{matrix}$
 $\{x | x \neq -1, 6\}$

⑧ Error/undefined when $x=-2$
 $-2-k=0$
 $-k=2$
 $k=-2$

⑨ $x^2-49=0$
 $x^2=49$
 $x=\pm 7$
 Can't be $-7 \therefore \boxed{x=7}$

⑩ $\frac{x^2+2x+1}{x+1} = 9$
 $\frac{(x+1)^2}{(x+1)} = 9$
 $x+1=9$
 $x=8$

⑪ $\frac{8k+16}{9k+18} = \frac{8(k+2)}{9(k+2)} = \frac{8}{9}$

⑫ $\frac{20r+10}{30r+15} = \frac{10(2r+1)}{15(2r+1)} = \frac{2}{3}$

⑬ $\frac{3(t+5)}{(t+5)(t-3)} = \frac{3}{t-3}$

⑭ $\frac{-8(y+4)}{(y+2)(y+4)} = \frac{-8}{y+2}$

⑮ $\frac{8x^2+16x}{4x^2} = \frac{8x(x+2)}{4x^2}$

OR $\frac{2(x+2)}{x}$
 $\frac{2x+4}{x}$

Unit 6 Day 1 Continued

(2)

$$(16) \frac{36y^2 + 72y}{9y} = \frac{36y(y+2)}{9y} = 4(y+2) = \boxed{4y+8}$$

$$(17) \frac{m^2 - 4m + 4}{m^2 + m - 6} = \frac{(m-2)^2}{(m-2)(m+3)} = \boxed{\frac{m-2}{m+3}}$$

$$(18) \frac{r^2 - r - 6}{r^2 + r - 12} = \frac{(r-3)(r+2)}{(r+4)(r-3)} = \boxed{\frac{r+2}{r+4}}$$

$$(19) \frac{8m^2 + 6m - 9}{16m^2 - 9} = \frac{(4m-3)(2m+3)}{(4m-3)(4m+3)} = \boxed{\frac{2m+3}{4m+3}}$$

$$(21) \frac{15p^3}{9p^2} \div \frac{6p}{10p^2} = \frac{\cancel{15}p^{\cancel{3}2}}{\cancel{9}p^{\cancel{2}1}} \cdot \frac{\cancel{10}p^{\cancel{2}1}}{\cancel{6}p^{\cancel{1}0}} = \boxed{\frac{25p^2}{9}}$$

$$(22) \frac{3r^2}{9r^3} \div \frac{8r^3}{6r} = \frac{\cancel{3}r^{\cancel{2}1}}{\cancel{9}r^{\cancel{3}2}} \cdot \frac{\cancel{6}r^{\cancel{1}0}}{\cancel{4}r^{\cancel{3}2}} = \boxed{\frac{1}{4r^3}}$$

$$(23) \frac{2k+8}{6} \div \frac{3k+12}{2} = \frac{2(\cancel{k+4})}{\cancel{6}3} \cdot \frac{2}{\cancel{3}(\cancel{k+4})} = \boxed{\frac{2}{9}}$$

$$(24) \frac{5m+25}{10} \cdot \frac{12}{6m+30} = \frac{\cancel{5}(m+5)}{\cancel{10}2} \cdot \frac{\cancel{12}6}{\cancel{6}(m+5)} = \boxed{1}$$

$$(25) \frac{x^2 + x}{5} \cdot \frac{25}{xy+y} = \frac{x(\cancel{x+1})}{\cancel{5}1} \cdot \frac{\cancel{25}5}{y(\cancel{x+1})} = \boxed{\frac{5x}{y}}$$

$$(26) \frac{3m-15}{4m-20} \cdot \frac{m^2-10m+25}{12m-60} = \frac{\cancel{3}(m-5)}{\cancel{4}(m-5)} \cdot \frac{\cancel{(m-5)}^2}{\cancel{12}3(m-5)} = \boxed{\frac{m-5}{16}}$$

(20)

$$\frac{w^2 + 11w + 4}{3y^2 + 7y + 4} = \frac{(2y+1)(y+4)}{(3y+4)(y+1)} = \boxed{\frac{2y+1}{y+1}}$$

Unit 6 Day 1 continued

(3)

$$(27) \frac{4a+12}{2a-10} \div \frac{a^2-9}{a^2-a-20} = \frac{\cancel{2}(a+3)}{\cancel{2}(a-5)} \cdot \frac{(a-5)(a+4)}{(a-5)(a+3)} = \boxed{\frac{2(a+4)}{a-3} \text{ or } \frac{2a+8}{a-3}}$$

$$(28) \frac{6r-18}{9r^2+6r-24} \cdot \frac{12r-16}{4r-12} = \frac{\cancel{6}(r-3)}{\cancel{3}(3r-4)(r+2)} \cdot \frac{\cancel{4}(3r-4)}{\cancel{4}(r-3)} = \boxed{\frac{2}{r+2}}$$

$$(29) \frac{p^2-p-12}{p^2-2p-15} \cdot \frac{p^2-9p+20}{p^2-8p+16} = \frac{(p-4)(p+3)}{(p-5)(p+3)} \cdot \frac{(p-5)(p-4)}{(p-4)(p-4)} = 1$$

$$(30) \frac{x^2+2x-15}{x^2+11x+30} \cdot \frac{x^2+2x-24}{x^2-8x+15} = \frac{(x-3)(x+5)}{(x+6)(x+5)} \cdot \frac{(x-4)(x+6)}{(x-3)(x-5)} = \boxed{\frac{x-4}{x-5}}$$

$$(31) \frac{m^2+3m+2}{m^2+5m+4} \div \frac{m^2+5m+6}{m^2+10m+24} = \frac{(m+2)(m+1)}{(m+4)(m+1)} \cdot \frac{(m+6)(m+4)}{(m+3)(m+2)} = \boxed{\frac{m+6}{m+3}}$$

$$(32) \frac{y^2+y-2}{y^2+3y-4} \div \frac{y^2+3y+2}{y^2+4y+3} = \frac{(y-1)(y+2)}{(y+4)(y-1)} \cdot \frac{(y+3)(y+1)}{(y+2)(y+1)} = \boxed{\frac{y+3}{y+4}}$$

$$(33) \frac{(ac+ad)+(bc+bd)}{a^2-b^2} \cdot \frac{a^3-b^3}{2a^2+2ab+b^2} = \frac{(a+d)(c+d)}{(a-b)(a+b)} \cdot \frac{(a-b)(a^2+ab+b^2)}{2(a^2+ab+b^2)} = \boxed{\frac{c+d}{2}}$$

$$(36) \frac{x^2-y^2}{(x-y)^2} \cdot \frac{x^2-xy+y^2}{x^2-2xy+y^2} \div \frac{x^3+y^3}{(x-y)^4} = \frac{(x-y)(x+y)}{(x-y)^2} \cdot \frac{x^2-xy+y^2}{(x-y)^2} \cdot \frac{(x-y)^4}{(x-y)(x^2+xy+y^2)} = \boxed{x-y}$$